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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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| 09/223,472 | 12/30/98 | LEE K | 042390.P6604 |

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MICHAEL A BERNADICOU
BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES CA 90025-1026

| EXAMINER | |
|---|---|
| LEADER, W | |
| ART UNIT | PAPER NUMBER |
| 1741 | 11 |

DATE MAILED: 05/08/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

| Application No. | Applicant(s) |
|---|---|
| 09/223,472 | Lee |
| **Examiner** | **Group Art Unit** |
| William Leader | 1741 |

***—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—***

**Period for Response**

A SHORTENED STATUTORY PERIOD FOR RESPONSE IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication .
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

**Status**

☒ Responsive to communication(s) filed on 2/20/01 (with a certificate of mailing dated 2/14/01).

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

**Disposition of Claims**

☒ Claim(s) 1-5 and 18-38 is/are pending in the application.

Of the above claim(s)_____ is/are withdrawn from consideration.

☐ Claim(s)_____ is/are allowed.

☒ Claim(s) 1-5 and 18-38 is/are rejected.

☐ Claim(s)_____ is/are objected to.

☐ Claim(s)_____ are subject to restriction or election requirement.

**Application Papers**

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The proposed drawing correction, filed on_____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on_____ is/are objected to by the Examiner.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119 (a)-(d)**

☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 11 9(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number)_____.

☐ received in this national stage application from the International Bureau (PCT Rule 1 7.2(a)).

*Certified copies not received:_____.

**Attachment(s)**

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s)._____

☐ Interview Summary, PTO-413

☐ Notice of References Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other_____

**Office Action Summary**

Receipt of the response filed on February 20, 2001, is acknowledged. Claims 1-5, and 18-38 are pending.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-5 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Mori (5,443,707) for the reasons of record and in view of the following comments.

Claims 19 and 21-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Mori (5,443,707) for the reasons of record and in view of the following comments.

Claims 27-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (5,443,707) for the reasons of record and in view of the following comments.

Claims 34-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Mori (5,443,707) for the reasons of record and in view of the following comments.

Claims 1, 3, 4 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Kobayashi (5,830,334) for the reasons of record and in view of the

following comments.

Claims 1, 27-33 and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomoeda et al (5,629,913) for the reasons of record and in view of the following comments.

Claims 1, 3-5, 18, 19, 22-27 and 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arken et al (6,001,235) for the reasons of record and in view of the following comments.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arken et al (6,001,235) as applied to claims 1, 3-5, 18, 19, 22-27 and 29-33 above, and further in view of Mori (5,443,707) for the reasons of record and in view of the following comments.

Claims 21-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi (5,830,334) for the reasons of record and in view of the following comments.

Applicant's Remarks have been carefully considered but are not deemed to be

persuasive. At page 2 of the Remarks, applicant refers to the description of the preferred embodiments at page 4 of the specification. Applicant indicates that this portion of the specification discloses an embodiment that is limited to "a technique for coating a substrate with a liquid material in such a way that the liquid material forms a coating with acceptable thickness uniformity across the substrate while avoiding the use of rotary or other mechanical motion to create a rotational liquid material flow." The Examiner concurs that page 4, lines 20-22 do teach the avoidance of rotary or other mechanical motion to create rotational flow. However, it is improper to read the disclosure of embodiments of the invention from the specification into the claims. While the claims are read in light of the specification, it is the language of the claims that define the scope of the invention.

It is the continuing position of the Examiner that the claims, as written, do not exclude the use of rotary or other mechanical motion. Claim 1 is written in open form using the term "comprising". Use of this term allows process steps other than those specifically recited to be included within the scope of the claim. Thus, the claims are open to a step rotary or other mechanical motion. Applicant points to the limitation from claims 1 that requires "directing the liquid material angularly toward the substrate surface so that the liquid material flows rotationally upon contact with the substrate surface." Nothing in this limitation is seen as precluding the use of rotary or other mechanical motion. Liquid material angularly directed

toward a substrate which is itself rotating as is the substrate of Mori would flow rotationally upon contact with the substrate surface as claimed by applicant.

At page 4 of the Remarks, applicant argues that identical flow regimes are depicted in Mori at Figures 1, 3 and 6 in spite of there being three different porous anodes that would materially alter flow patterns, and concludes that Mori either does not understand or does not appreciate streamlined flow in a sudden enlargement. This argument is not convincing. A reference is taken for what it would have suggested to one of ordinary skill in the art at the time the invention was made. By including arrows indicating the direction of flow, figures 1, 3 and 6 of Mori clearly suggest flow of electrolyte toward a substrate at an angle other than perpendicular to the substantially planar surface of the substrate. In all of figures 1, 3 and 6 Mori includes arrows which show flow at an angle to a line which is perpendicular to the substrate's planar surface. While the arrow indicating flow direction in the center of figures 1, 3 and 6 does appear to be substantially perpendicular to the surface of the substrate, such perpendicular flow is not excluded by the claims. Indeed, in applicant's figures 2, element 348 is provided "so that liquid spray emanating therefrom is directed at an angle perpendicular to the substrate surface" (page 7, lines 1-3).

At page 3 of the Remarks, applicant takes issue with the contention that 0° from perpendicular (i.e., flow perpendicular to the surface of the substrate) is still

an angle that would fall within the scope of the limitation "angularly". Again, the wording used by applicant at page 7, lines 1-3 of the specification it noted. In these lines applicant refers to "an angle perpendicular to the substrate surface". Thus, in this portion of the specification, applicant appears to consider the perpendicular direction to be an "angle". It is noted that claim 1 simply refers to "the substrate surface". No configuration of the substrate has been recited. While applicant's figures show the substrate as being substantially planar, there in no such limitation in the claim. Consequently, claim 1 includes surfaces other than planar. Thus, claim 1 includes flow which is at a non zero angle with respect to one area of the surface but which is at a zero angle (perpendicular) to another area of the surface.

As noted above, claim 1 requires the liquid to flow "rotationally" upon contact with the substrate surface. The term "rotationally" has not been defined in the claim itself, or in the specification. In one embodiment of the invention as disclosed in the specification, applicant appear to take rotationally to indicate that the flow of liquid applied to the substrate is in a roughly circular direction around a central axis of the substrate when viewed from above. This interpretation appears to be supported by the description at page 7, line 4 which refers to "preventing a void from forming in the vortex of the electroplating liquid". As defined by Merriam-Webster's Collegiate Dictionary, tenth edition, vortex is "a mass of fluid (as a liquid)

with a whirling or circular motion that tends to form a cavity or vacuum in the center of the circle ...". While this motion is one illustration of the term "rotationally" as used in the claims, the term is not so limited. Figure 1D depicts an embodiment in which in which a nozzle is angled away from vertical by an angle preferably in the range of 20 to 60 degrees. Nothing is said about the nozzle additionally being angled into or away from the plane of the paper. The liquid emerging from the nozzle is shown as impacting the cylindrical side wall 30 of the apparatus and then flowing toward the substrate. As viewed from the top, after impacting the side wall, liquid would be expected to flow equally in a clockwise and counterclockwise direction. There would appear to be no net rotational flow in either the clockwise or counterclockwise direction. Upon contact with the substrate, liquid would appear to flow along the substrate surface in plurality of directions including toward the center of the substrate. Because claim 1 is interpreted to include this embodiment, it appears to include flow generally along the surface of the substrate.

Since the term "rotationally" has not been separately defined by applicant, the standard dictionary meaning is assumed. Merriam-Webster's Collegiate Dictionary, tenth edition, defines "rotation" as "the action or process of rotating on or as if on an axis or center." Based on the dictionary definition, claim 1 is taken to include *any* rotational liquid flow around *any* axis after contact with the substrate

surface. This would include eddies formed by turbulence and other flow patterns where the axis of rotation is parallel to the surface of the substrate.

At page 5 of the Remarks, applicant argues that Kobayashi teaches a nozzle that can create only an inward radial flow and argues that rotational flow can only be accomplished by rotating either the nozzle or the substrate. This argument is not convincing. As explained above, the claims are not limited to circular flow about the central axis of a planar substrate so that a vertex is created. The scope of claim 1 is broad and is considered to encompass the flow of Kobayashi.

At page 9 of the Remarks, applicant expresses a belief that the Examiner is trying to assert that the flow lines illustrate in Mori are a plurality of vents. This belief is incorrect. The Examiner's position is that each of the openings in the mesh anode through which the electrolyte flows, shown for example in figure 6, may be considered to be a spray outlet as recited, for example, in claim 19.

At page 10 of the Remarks, applicant expresses a belief that the Examiner has interpreted the line drawn in figure 7 of Mori to be flow lines. This belief is incorrect. As stated at pages 4-5 of the previous office action, the Examiner was not trying to direct the applicant to the electric field lines, but rather to show the mesh anode from a top view.

At page 11 of the Remarks, applicant argues that it is only by rotation of Tomoeda's spin chuck 101, that any rotational flow regime may be established.

Applicant further argues that Arken is just another reference that relies on rotary parts motion. These arguments are not convincing. As explained above, applicant's claim language does not exclude the use of rotational or other mechanical motion.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William Leader, whose telephone number is (703) 308-2530. The examiner can normally be reached Mondays-Fridays from 7:30 AM to 3:30 PM eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kathryn Gorgos can be reached at (703) 308-3328. The fax phone number for *official* after final faxes is (703) 872-9311. The fax phone number for all other *official* faxes is (703) 872-9310. Unofficial communications to the Examiner should be faxed to (703) 305-7719.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0661.

WTL

William Leader:wtl
May 4, 2001

Kathryn Gorgos
Supervisory Patent Examiner
Technology Center 1700